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## ARCHEOLOGY OF THE PONCA CREEK DISTRICT, EASTERN NEBRASKA

By ROBERT F. GILDER

In the fall of 1903 I commenced a study of the surface archeology of the northern portion of Douglas county, Nebraska, by collecting artifacts from the cultivated fields of that locality. Several months were spent in examining the ground, and although the net result was small, I was able to gather a collection of scrapers and the smaller projectile points, besides a large number of potsherds ranging from bits the size of a dime to others as large as one's hand, and about half a peck of flint chips and flakes. Most of these objects were taken from one field in what I have designated the Ponca Creek district.

The following spring I turned my attention to locating a large number of saucer-like depressions in the earth, known locally as "buffalo wallows," in reality sites of aboriginal earth lodges. I found that these circles began just inside the limits of the town of Florence and extended about seven miles northward. Almost every circle had been dug into, although in each instance the excavation had been confined to its center, the other portions not having been molested. Wherever excavation had been recent I found small sherds, and flint chips, ashes, and charcoal.

Florence, Nebraska, for the greater part is situated on a bench thirty feet above the valley of the Missouri river, which forms the eastern boundary of the city. Near its northern limits Mill creek flows through from west to east and empties into the Missouri. North of this stream the land begins to rise into high ridges, with deep valleys between. The flood-plain of the river lies at the right hand, or to the east, along which a road runs northward close under the bluffs. These ridges are parallel, or nearly so, to the river valley, and half a mile from Mill creek they reach a height of 160 feet above the river level, continuing for a mile when an east-and-west

valley cuts them ; then they rise again to about the same height, and again are intersected by deep gorges.

The geology of these hills is simple — about 150 feet of bright buff loess resting upon fifteen to twenty feet of glacial clay and drift, beneath which is carboniferous. The loess carries no stones, but lime tubes are met with at all elevations.

The first house circle is found on the bench just north of Mill creek, close to the bluff and river, below the first ridge. The second appears almost at the top of the first ridge north of the main street of Florence, an extension of which would cut directly through the eastern side of the circle, the line fence intersecting the circle in its center. The third circle of this series lies 500 yards farther north on the highest part of the ridge ; the fourth is half a mile west and north of the third. These four sites average about 55 feet in diameter. That there are other sites closely connected with and between these there is no question, but cultivation and the erosion of years has brought them to the level of the surrounding surface and therefore they are indistinguishable. Farther north the timber with which the slopes of the ridges are covered gradually increases and covers their summits as well. This land has been for years the property of one family and very little of it has been cultivated, so that the farther north one goes away from Florence the more numerous and clearly defined are the house sites.

Ponca Creek district lies on both sides of the stream of that name, two and one-quarter miles north of Florence. A valley cuts in from the west, and although the sites are more numerous on the northern rise from the creek there are several large and well-defined lodge sites on the ridges to the south.

The most extensive collection of house sites, and the only one showing the characteristics of a village, extends up the slope from Ponca creek to the north and caps the ridge. Skirting a road parallel with and north of the creek is a field that has been farmed intermittently for almost a century, the original clearing having been used by John P. Cabanne, near whose fur-trading post site the field is situated, and is probably the first ground tilled by whites in the present state of Nebraska. The field is 200 yards wide and 500 long, running with the road and creek. In the center of the field,

where a ridge begins its rise that terminates two miles northwestward is a very large house site, but its circular line is cut and its surface is nearly that of the surrounding field. The plow has brought to the surface spear and arrow points of flint, grooved stone hammers, celts, scores of hide scrapers, and innumerable potsherds.

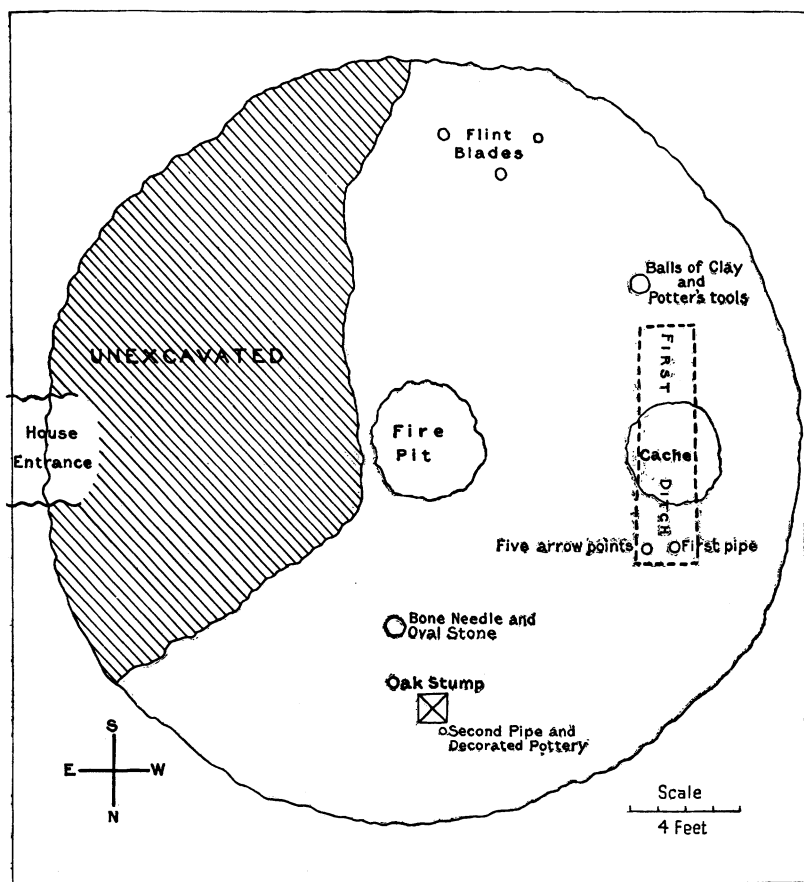


FIG. 43. — Ground plan of house site, Work No. 1.

Following the ridge up into the timber small circles are found on the slopes, and at its summit are seven, the largest measuring eighty feet in diameter, with its center at present four feet below the surrounding level. A heavy growth of timber now covers the entire

village. As in all the others some one had dug down to the central fireplace of the largest circle.

In the spring of 1907 I dug a trench from the old excavation westward to a point five feet from the rim ; then northward an intersecting ditch twelve feet long and five deep. At the beginning of the second ditch remains of a post were encountered, consisting of wood powder surrounded partly by thin bark. The post apparently had been six inches in diameter. Six feet farther on another post was found, as much deteriorated as the first. Potsherds, charcoal, flint chips, and a large flaked flint blade were here procured.

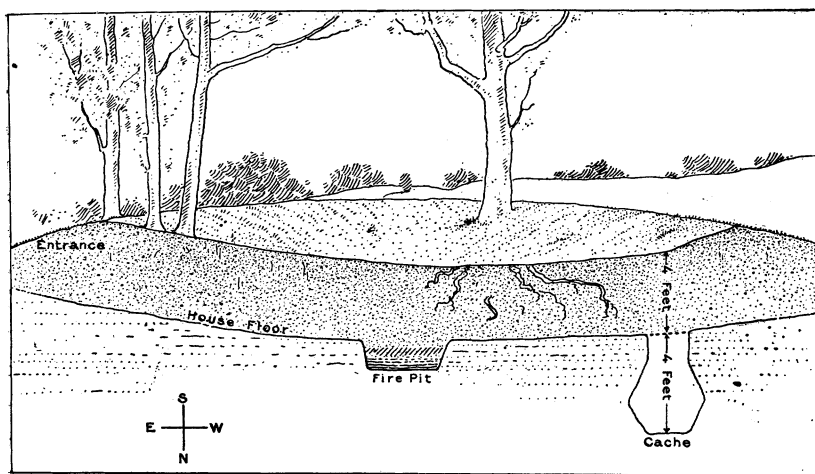


FIG. 44. — Sectional view of house site, Work No. 1.

A hundred yards east of the circle last described was another, very ancient in appearance, its outlines being barely discernible. Some amateur had dug down to the fireplace, but otherwise it was intact. This site, which I shall designate as Work No. 1, was about thirty feet in diameter. On the western side, close to where the slight dip was made from the surrounding surface, I began operations in April of this year, starting a trench at the southwestern end of a square and extending it northward seventeen feet, with the intention of carrying it through the circle to the east its entire width of seventeen feet and down below the floor of the house. After

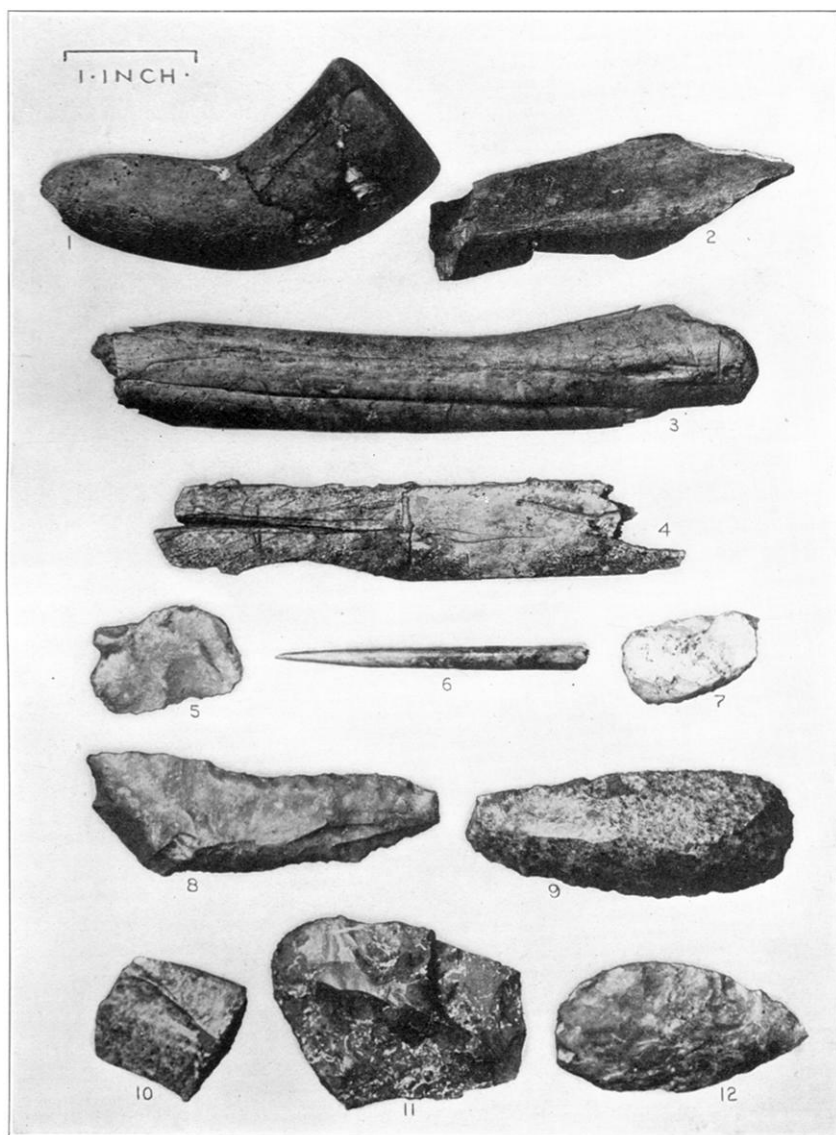
digging through two feet of dark loam a mixed light and dark soil was encountered eighteen inches deep, then six inches of lighter-colored soil or loess slightly mixed with dark soil packed quite hard. Beneath this was the floor of the dwelling.

Having provided myself with a sketch of Maximilian's plan of a Mandan dwelling, I kept a close lookout for a cache. In digging the first trench it was noted that twelve feet directly west of the fireplace the earth was not so compact as were the other parts of the floor. At the northern end of the trench a dark clay tube pipe, lying upon the floor, was found, and near it were five arrowpoints. With a sharp spade, made expressly for the purpose, I shaved down the sides of the ditch, going beneath the floor, until the trench was four feet wide. All through the floor, which was of much darker material than the earth immediately above it, and a foot thick, were potsherds, chips of flint, and bits of charcoal. When the trench became sufficiently wide to admit of careful work I returned to the softer spot behind the fireplace and excavated there. The soil was yellow loess, packed reasonably hard, but not so hard as was the floor of the dwelling, and every shovelful showed that it had been moved. The sides of a cache were soon encountered and followed to the bottom at eight feet below the surface of the ground and four feet beneath the house floor. In the cache were the following objects :

Five arrowshaft smoothers, six bivalve shells, one shell ornament, sixteen flint hide-scrapers, twelve flint blades, five broken flint blades, four triangular flint blades, one large flint blade, seven flint arrowheads, two large narrow flint blades, one flint drill, two pieces of red ocher, one paint stone, a horn chipper or flaker, a clay bead, a drilled antelope horn, a large bone awl, a sawed elk horn, three bone needles, six small bone implements sharpened to a point, a bone spear barb, three "ivory" stones from fish heads, five large bone hoes, one sandstone for pointing bone implements, half a bushel of potsherds, several large pieces of earthen vessels, including rims and a third of the bowls, and a dozen shank and rib bones of an elk or a buffalo (plates XLIII, XLIV).

Three feet southeast of the cache were found the following objects :

Six balls of clay, a ball of lime, a bone pestle, a small bone hoe or potter's tool, twelve pieces of granitic rock that had been burned,



OBJECTS FROM FLOOR OF HOUSE SITE, WORK NO. 1, PONCA CREEK DISTRICT

1, Tube Pipe; 2, Bone Punch; 3 and 4, Bone Gouges (No. 3 has been drilled through at one end); 5, Flint Scraper; 6, Bone Needle; 7, Small Flint Scraper; 8, 9, 10, 11, 12, Flint Blades.

four pieces of sandstone, and five pieces of an unburned pot. There was evidence of fire on the surface of the floor.

On another ridge across the valley through which Ponca creek flows—five hundred yards south of Work No. 1—I began Work No. 2 in the same manner, except that the trench was run too near the western rim of the site. Thinking that perhaps there was no cache in this site, I went to the northern side and trenched east and west ten feet, getting below the house floor. At three feet the floor was reached and the trench was being extended south of the center of the site when a small cache was encountered, the bottom of which was two feet below the house floor, where, beneath a stone the size of one's two fists, was found, nicely laid down, nine unnotched arrow-points, seven narrow flint knives of particularly fine workmanship, and three celt hatchets—one of diorite, one of greenstone, and the third a narrow implement of white flint. The diorite and flint hatchets were chipped, while the greenstone implement was ground. A large mother-of-pearl shell was also in the cache (plate XLIV).

Returning to the first trench I worked toward the center of the site, and on proceeding about two feet discovered the entrance to a cache, the bottom of which was eight feet below the surface of the circle and not more than three feet in diameter. From this cache the following articles were taken :

Four arrowpoints, eight bivalve shells, four of which had been drilled through at the hinge; three shell beads drilled from each side (the shells and beads lay on the bottom of the cache among the fragments of a small pot); one oval shell ornament; an egg-shaped pipe bowl; three large pieces of pottery, showing rim designs and lugs; four chipped blades, and a kernel of corn, somewhat parched (plates XLII, XLIII).

Work No. 3 was begun in a very unpromising circle, twenty-five feet in diameter, situated upon a steep slope of a ridge and about a hundred feet from the top of the hill, which rises to an altitude of fifty feet more. Thinking that perhaps the entrance would be upon the lower side, I began work on the south or up-hill side, but no cache was found, although a trench six by twelve feet was cut. Operations were next begun on the western side, and the cache was soon discovered. Bits of pottery were observed when the floor



was reached some three feet below the surface of the ground, and a section of a large boulder of crescent shape was found. The next shovelful of earth brought out a fish made from a mother-of-pearl shell, the head being portioned off by incised markings on both sides. Eyes had been drilled part way through the shell, and near

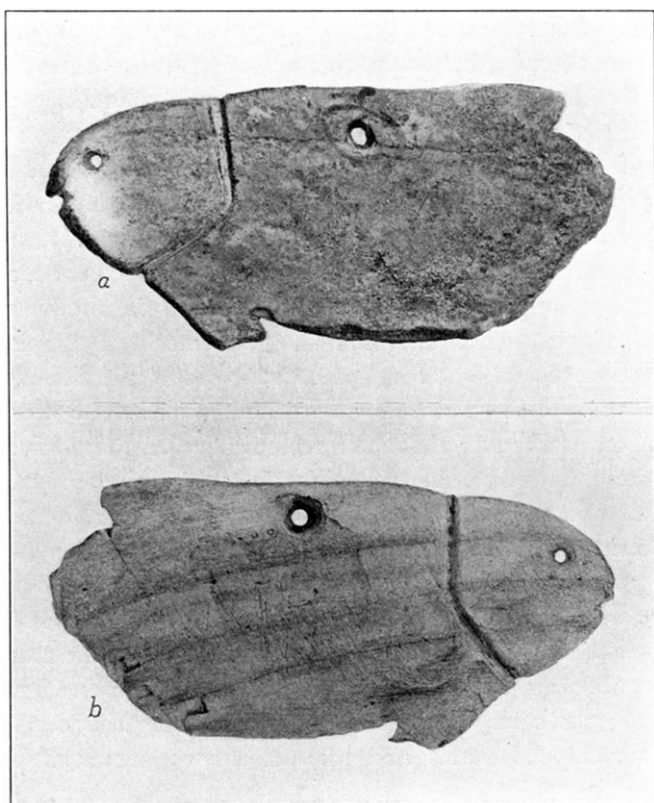
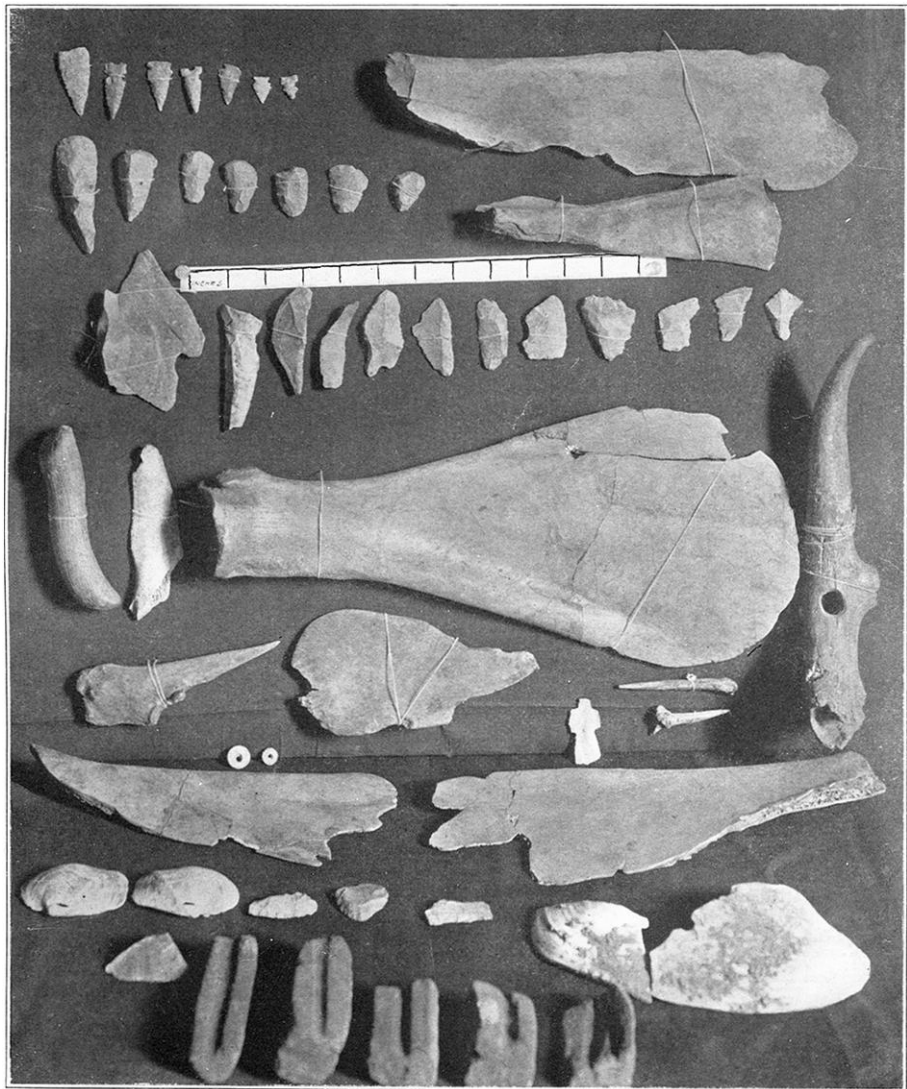


FIG. 45. — Shell pendant found in Work No. 3; natural size.  
(*a*, concave side; *b*, convex side.)

the dorsal fin a hole had been drilled evidently for the purpose of suspending the object as a pendant (fig. 45). Another small shell that had been ground down to shape, and several large pot rims and sherds, including one lug, were found. This circle was situated on a bluff overlooking the old bed of the river. Works Nos. 1 and 2 were about a quarter of a mile back from the old stream bed.



OBJECTS FROM WORK NO. 1, PONCA CREEK DISTRICT

Bone Hoes, Bone Punches, Pierced Antelope Horn, Flint Blades, Scrapers, Projectile Points, Dakota Sandstone  
Arrowshaft Smoothers, and Perforated Shells and Shell Beads.

At the summit of the ridge, a quarter of a mile south of Work No. 3, operations were begun to the west of a circle 44 feet in diameter. The cache was soon found, but a single broken arrowpoint and a small potsherd were the only objects unearthed. The bottom of this cache was five feet below the floor level, and the house floor was three and one-half feet below the surface of the circle.

This practically ended my spring work.

The first of September of the current year I commenced work at the site in the northern limits of Florence by digging a trench, eight feet long and eight feet deep, on its western side. The result showed three periods of occupancy of the site, indicated by the finding of three distinct floors about eighteen inches apart. These floors were strewn with charcoal and with bits of flint and sherds, while the earth between them was packed hard and contained flakes of charcoal.

The exposed situation of this site caused me to move my operations back into the Ponca Creek district, so that the isolation might prevent others from destroying whatever results I might obtain if disturbed during my absence. Consequently operations were recommenced where the excavations had been suspended in Work No. 1. These consisted of lengthening and widening the first ditch so as to cover more than half the entire circle. As this work progressed a bone gouge was uncovered which had been worn round and smooth at one end. This implement had been made by splitting the tibia of a deer or an antelope. A hole had been drilled through the bone, and the gouge shows two half-circles where the drilling tool had passed through (plate XLII, 3). Another tube pipe, smaller than the first, was found (plate XLII, 1); it still contained the carbonated lining, the result of long use. A fine flint blade, two scrapers, and a nicely sharpened flint knife were next found, and then a lug with a human face modeled upon its outer curve (fig. 46). The nose is large and

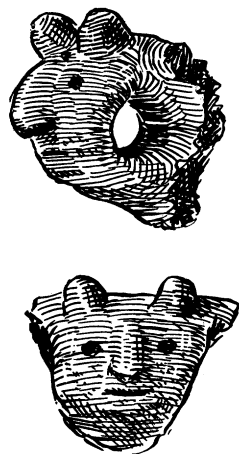


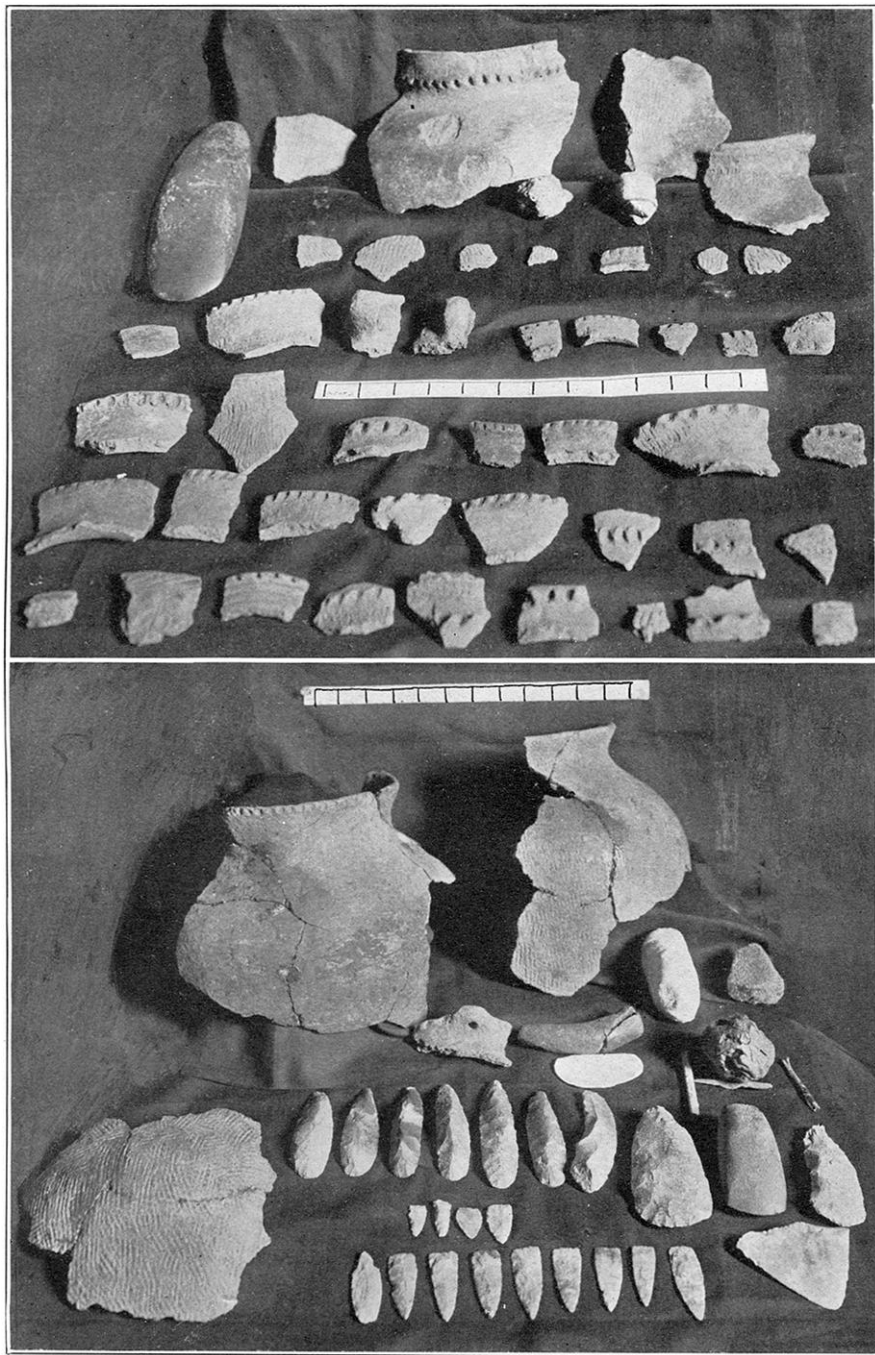
FIG. 46.—Ornamental pot-lug. (One half nat. size.)

hooked, lips thin, chin receding, eyes round and staring, and over the latter two short horns protrude. The face is quite different from that of other pottery decorations that have come under my notice. All of these objects were found beneath the roots of a large oak tree that had grown from the right of the fireplace when facing westward. It was impossible to locate the posts that must have supported the rafters of this dwelling. There was no sign, not even a slight discoloration of the earth, where the posts are supposed to have stood. Large and small drift spalls, nearly all of them fractured, were found scattered over the floor and beneath it. The ash-bed was more than a foot deep.

All the house sites examined were at least a foot lower in the center than at the rim, and some were four feet deep. The same contour applied to the house floor, although where the circle was nearly filled with earth the saucer-shape of the floor beneath was more pronounced than on the surface.

One of the difficulties at first encountered was the meeting with three distinct types of dwelling sites. My object primarily was to carry on the work of exploration in sites, similar to those described, which offered surface evidences of being older than the others. One site, instead of being a circular depression, is a circular mound. In two of the latter opened and examined, no pottery was found, and each had in the center a fireplace in which were buffalo and deer bones, but no stone tools or chips. Another such mound produced crude flint implements, a little pottery, and what appear to be bits of human bones, the ends of which bear marks that are seemingly the incisions of human teeth. Some of the bones had been split and one had been incised, presumably with a flint blade. I was unable to finish the exploration of this site, but intend to do so when the opportunity affords.

*Pottery.* — The pottery obtained in the caches and house sites hitherto described is of marked excellence. The rims of the vessels exhibit many decorative designs, and the bowls the marks of the grass paddle as well as smooth and incised surfaces. From Work No. 1, twenty-seven rims of more than a dozen different patterns were taken (fig. 47). Eight feet from the fireplace, in the southwestern section of the circle, were a small hoe-shaped implement



OBJECTS FROM WORKS NO. 1 AND NO. 2, PONCA CREEK DISTRICT

From Work No. 1: Potsherds, Lugs and Rim Designs, Tube Pipe, Balls of Clay and Lime, Small Bone Implements and Shell Ornament. From Work No. 2: Long Flint Blades, Triangular Flint Blade, Projectile Points, and Celt Hatchets.

made from a scapula, probably of an antelope; five balls of clay; two pointed splinters of bone, the sharpened ends of which show use; a dozen fired granite spalls, which could be easily crumbled in the hand; and a ball of lime. Three of the clay balls are mixed with lime, probably for the purpose of tempering the clay. Lying

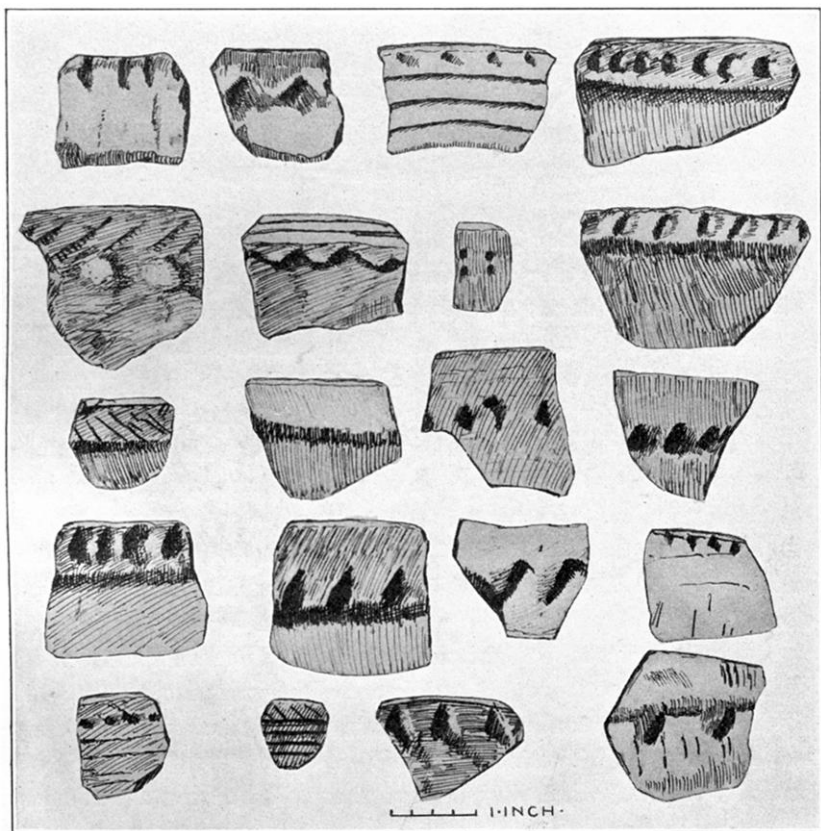


FIG. 47.—Detail of rim designs, Work No. 1.

beside these objects were five pieces of an unfired pot. One of the clay balls retains what seems to be the imprint of the potter's fingernails.

Nearly all the finished pottery is in a good state of preservation. No whole vessel was found. To one piece of very heavy pottery,

about two-thirds of a pot that would probably have held four gallons, one-half of the rim adhered. One piece, larger than a man's hand, appeared to have been rudely glazed. This sherd is of a reddish-orange color on the outside, and although it was accidentally dropped upon a bare floor it did not crack. There appears to be almost as much granitic binder used in the ware as there is of clay.

Of the two tube pipes one is of dark bluish clay while the other is smaller and of much lighter color. The smaller or stem end was evidently placed between the lips of the smoker, the aperture through which the smoke was drawn being too small to admit of the insertion of a stem.

The bead is of very light-colored clay and appears to have been made in two pieces fused together probably by fire.

The pot lug decorated with the representation of a human face is unique. The front view gives the impression of an owl, but the presence of the hooked nose, thin lips, and wide mouth, beneath which is a well-rounded but weak chin, rejects such an assumption, the only feature at all resembling an owl being the two protuberances over the eyes, which, in an owl, range backward, while those on the lug incline forward.

The pottery is well burned and was made in many sizes — the capacity of the largest pot was perhaps four gallons. One small neck of a pot, with an opening not larger than a common lead pencil, was found. Incised designs are sometimes found on sherds, while the marks of a grass-wound paddle are of frequent occurrence; but by far the larger number of sherds are devoid of markings and are finished smooth. The incised markings on the bowls of the pots could hardly be called designs, but those on the rims are of more systematic occurrence.

Showing the sherds to a friend who was formerly a gold prospector, he called my attention to several small particles in many of them which looked like gold, and upon my request he extracted a few and submitted them to a test which proved beyond question that they are flake gold. The question of finding gold in these sherds is easily answered when one considers that the river bluffs at the base of which the aborigines secured clay for pottery are within

a few hundred miles of gold-bearing mountains, and gold flakes are occasionally washed from the sand of both the Missouri and the Platte at the present day, it having probably come down in the sand-laden waters of these rivers during the annual spring floods.

*Stone Implements.* — The flint used in the implement making is of several kinds. Some of the longer knives are made of a dark

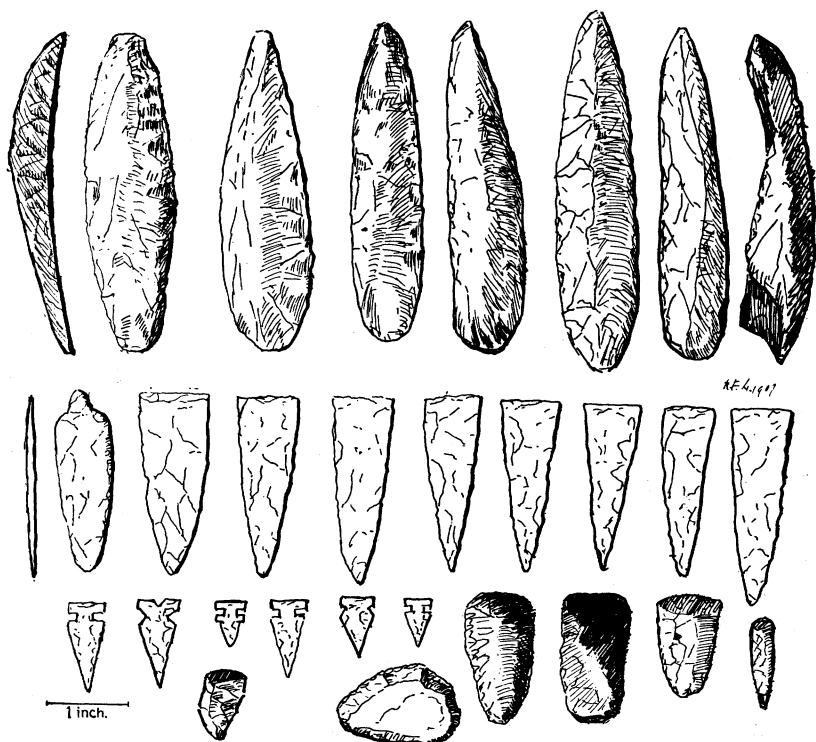


FIG. 48. — Flint blades, projectile points, and scrapers, from cache, Work No. 2.

flint, almost the color of obsidian, similar to that of implements found on both banks of the Mississippi near St Louis. Other flint resembles the native Nebraska kind found in nodules in many limestone ledges.

The hatchet and several arrowpoints are made of a white or yellowish-white flint, much like the glossy white flint found in Wisconsin.



The arrowshaft smoothers are similar in shape to those found in British Columbia, and are made of a reddish-orange Dakota sandstone. The large stone, 4 by 5 inches, used for pointing bone implements, is of similar material.

The materials of the diorite and greenstone hatchets are from the glacial drift.

Throughout the whole work spalls were encountered. Some are of diorite, while others, and by far the larger part, are of granitic rock, sandstone, or pink Sioux quartzite, the last being found in the drift in considerable quantities. Many quartzite spalls show fractured surfaces, as if rude implements had been in process of making, although quartzite implements were not found. Large numbers of quartzite chips, however, similar to those found by the writer on shop sites in other sections of the West, were encountered in every part of the floor. One of the last objects taken from Work No. 1 is a trap boulder weighing a pound; this is oval in shape, measuring 4 by 2 ½ inches, and 1 ½ inch thick. One side has been worked smooth, and the boulder appears as if it might have been used in smoothing pottery. Other trap boulders are irregular in shape and no use can be assigned to them. One resembles the blunt end of a small hammerstone.

*Bone Implements.*—All the bone hoes and the smaller implements, including the pestle, show evidence of having been subjected to hardening or tempering with fire. When first removed they were quite soft, but hardened rapidly and in three or four days began to split, necessitating the application of several coats of shellac.

The needles, awls, and punches are similar to like objects found on a Mandan village site in North Dakota by an expedition from Harvard University in 1906.<sup>1</sup>

The so-called "bone" pestle is actually a piece of deer antler smoothed and beveled on each end; it is five inches long and an inch in diameter, and both ends are worn quite smooth. It was found near the clay balls and potter's tools.

The elk horn referred to as having been sawed may have served as an implement, but its use has not been determined.

<sup>1</sup>See Will and Spinden, *The Mandans, Peabody Museum Papers*, vol. III, no. 4.

Among the articles procured in Work No. 1 is a pointed horn implement, the smaller end of which is the size of a lead pencil, while the opposite end is seven-eighths of an inch in diameter (fig. 49). The only use to which it can be assigned is that of flaking flints.

*Paint-stone and Pot.* — The paint-stone referred to in the list of objects taken from Work No. 1 is an irregular block of sand-stone, little more than half an inch thick, with its surfaces somewhat roughened. When found it was covered with dark red ocher, which, on being wet, stained the hands a much lighter shade. Considerable ocher is attached to both sides of the stone.

The paint bowl consists of a sherd about three inches in diameter. A few drops of red paint still adhere to the outer surface, showing that the pigment had been used in liquid form.

*Parched Corn.* — Two charred kernels of corn were found in Works Nos. 1 and 2. One of these is nearly entire, while the other is but a fraction of a grain and might have been some other seed. The larger grain differs from corn raised in the vicinity today, being much smaller.

*Charcoal Flakes and Charred Remains.* — When once the floor of the dwelling was reached, flakes of charcoal were found, having the appearance of being mixed into the material of the floor. In one place was found what seemed to be the charred remains of a rope of some material.

*Character of House Floors.* — The floors of the houses seem to have been tamped, being much more compact than the earth either above or beneath, and of a consistency resembling tough dough. At frequent intervals were brownish discolorations as if some article of skin had rotted away there.

*Pumice.* — In all house sites were lumps of coarse-grained pumice which floats on water. In the burial mounds of the vicinity the writer has also found bits and rounded pieces of the same stone — evidence connecting the builders of one with the builders of the other. This pumice floats down the Missouri river and occasion-



FIG. 49. — Implement of horn, probably used for flaking flints. ( $\frac{1}{2}$  nat. size.)

ally can be found along its banks. Lewis and Clark speak of floating pumice, and other early travelers up the Missouri through North Dakota tell of seeing walls of this volcanic rock at one point along the stream. I found but a single evidence that the material had been used for sharpening implements.

*Caches.* — The caches within the house sites are smaller in diameter near the top than at the bottom, the latter part flaring out somewhat in the manner of a large earthen pot. The bottom of the caches are rounded, and the walls are almost as hard as fired clay. In the very bottom of each cache was a quantity of dust, or earth as fine as dust (not compact as at other points), in which were found small arrowpoints, flint blades, shell beads, and flint flakes. In each case where the cache was found within the house circle it occurred close under the western wall, back of the fireplace and exactly opposite the entrance to the lodge, the latter in every instance facing the east. The apparent great age of the house sites renders a very accurate description almost impossible, but as the work progressed from day to day, notes were made of the conditions as they were found.

*Fireplace.* — The fireplace was in almost the exact center of the circle. In Work No. 1 the ash-bed was ten inches deep, beneath which were five inches of reddish loess about the consistency of soft brick. The bottom of the ash-pit was about a foot from the surrounding floor surface. No stones encircled the fireplace. As this is not a stony country, it is possible that the custom of encircling the fire-pit with stones, met with farther north, was not in vogue at the time of the occupancy of the dwellings. Very few objects were found in the immediate vicinity of the fireplace, which appeared to be about five feet in diameter.

*Dryness of Sites.* — The rainfall in this section is slight compared with that of the Atlantic coast, and the elevated situation of the house sites affords excellent drainage. It is true the saucer-shaped depression tends to retain snow and rainwater; but only such as falls within the circle can percolate into the soil, and many times have I worked in the circles after several days of rain, finding the soil entirely dry beneath the grass roots.

*Puzzling Features of the Work.* — There are some puzzling

features of the Ponca District work, and the conclusions reached tend to prove that the builders of these ancient houses were a sedentary people, living in peace with whatever neighbors they had. The latter conclusion is based on the isolation of a number of large house sites throughout the northern part of Douglas county and the southern part of Washington county. Among the house sites I have found groups of three, four, and five, while in other instances only a single house was found, the latter separated from any others by the distance of half a mile or more. Surely if there had been danger of attack by an enemy, these isolated dwellings would have been the ones to suffer most. It is probable that these houses were inhabited according to a communal system, and it may be that the larger dwellings housed twenty or thirty people ; but they were situated upon exposed and easily accessible sites and would have been at the mercy of any considerable foe. This deduction may be incorrect. A mile back from the river, beginning at a point the same distance northward from Florence, the Calhoun road cuts through a large house site. Half a mile north of this site, in a direct line, is another, and the same distance still farther to the north is a third, measuring ninety-two feet in diameter and at present four feet deep in the center. It is situated in a field that has been cultivated for many years, and it was probably much deeper before disturbed by tillage. About this site I have found excellent pottery, some finely-shaped projectile points and scrapers, as well as some very crude implements. There are four smaller circles surrounding the larger one within fifty yards. One mile north of the site last described is a large isolated circle, and there are at least a dozen more still farther north. All of these isolated sites are in a direct line north and south.

All these sites are situated on the highest hills in their vicinity. It may be that these isolated dwellings were thus placed in order to guard the larger aggregations of dwellings nearer the river valley.

Several years of labor in the mounds and circles of this neighborhood lead to the conclusion that at the time the dwellings were occupied these loess hills were entirely devoid of timber. To-day they are heavily timbered, or have been within the last few years. My assumption is that the timber grew up from the valley of the

Missouri. Only a few miles back from the river the vast plains of Nebraska begin, and continue to the mountain ranges of Wyoming, with occasional small forests along the streams.

On the Iowa side of the Missouri, directly across the valley from Ponca Creek district, the hill slopes and the ravines are heavily timbered, but the hilltops bear no indication that they were ever covered with trees. There are many settlers there to-day who followed the Indians in possession and declare the hills to have been never timbered. No roots or vegetal mold are found, the buff-yellow loess beginning at the very grass roots. Lewis and Clark speak of "bald-pated prairies" occurring where the same feature is noted to-day.

Were these Nebraska hills barren of timber, the watcher on the highest hills, especially from the elevation of his housetop, could see for miles in every direction, and the erection of the older dwellings upon these eminences might have been with a view of providing the best possible lookout for game or for foe.

*Period of Occupancy — Conclusion.* — The period of occupancy of the house sites can only be conjectured, but all evidence points to their habitation many centuries ago. Twenty yards back of Work No. 1 the ground at present slopes away from the site and then rises again several hundred yards farther to the northwest. In all other directions the ground slopes somewhat precipitously from the site, and it cannot be said that the two feet of earth that has formed over the remains of the walls of the earth lodge may be accounted for by erosion from higher hills—there are none at this time, and the contour of the surrounding surface precludes such an assumption.

Had a forest growth covered the site and its vicinity for a period of five hundred years, would the accretion of mold from decayed vegetal matter have amounted to more than two feet? It is not at all likely that a forest has grown over this village site for five hundred or even for two hundred years. The recurrence of vast fires, such as have swept the timbered tracts even within the period since white men first settled in the country adjacent to the Missouri river, has been noted by explorers and travelers, and it seems reasonable that the two feet of earth, or a part of that amount, covering the house ruins has been carried there by the winds of

ages. In substantiation of this theory it is necessary only to state that there are some able geologists who are of the belief, based on extended research, that the entire loess deposit of one hundred and sixty feet or more is nothing more than "wind-blown sand" or deposit from dust storms. A leader in this opinion is Professor Bohemil Shimek of the University of Iowa, who has devoted years to a study of the loess formation in many different states and who recently read a paper on this subject before the Iowa Anthropological Association. Some geologists say that under the conditions in which I have found these house circles it would require a century for one inch of earth to accumulate. If this theory be correct, then these dwellings were occupied as such two thousand years ago. Travelers declare that the thickest earth-lodge walls were of not more than eighteen inches.

In concluding I would call the attention of archeologists to the report on *The Mandans* by G. F. Will and H. J. Spinden, published by the Peabody Museum, Harvard University, in August, 1906, and ask them to draw such conclusions as they may respecting the people who occupied the "buffalo wallows" of Douglas county, Nebraska.

OMAHA, NEBRASKA.